

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

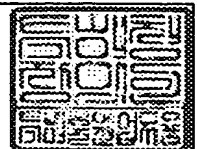
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| To: LEE, Soobok Postel Services, Co., Anam Tower 2018, Yoksam-dong 702-10, Kangnam-ku, Seoul 135-080, Republic of Korea | | Date of mailing <i>(day/month/year)</i> 27 APRIL 2001 (27.04.2001) |
| Applicant's or agent's file reference soobok04 | | IMPORTANT NOTIFICATION |
| International application No. PCT/KR00/00012 | International filing date <i>(day/month/year)</i> 11 JANUARY 2000 (11.01.2000) | Priority date <i>(day/months/year)</i> 13 JANUARY 1999 (13.01.1999) |
| Applicant LEE, Soobok | | |

1. The applicant is hereby notified that International Preliminary Examining Authority transmits here with the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**
 The applicant must enter the national phase before each elected office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

 Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

 For further details in the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

| | |
|---|--|
| Name and mailing address of the IPEA/KR Korean Intellectual Property Office Government Complex-Taejon, Dunsan-dong, So-ku, Taejon Metropolitan City 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer COMMISSIONER Telephone No. 82-42-481-5210 |
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PATENT COOPERATION TREATY


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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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|--|--|---|
| Applicant's or agent's file reference soobok04 | FOR FURTHER ACTION | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
| International application No. PCT/KR00/00012 | International filing date (day/month/year) 11 JANUARY 2000 (11.01.2000) | Priority date (day/month/year) 13 JANUARY 1999 (13.01.1999) |
| International Patent Classification (IPC) or national classification and IPC IPC7 H04L 12/58 | | |
| Applicant LEE, Soobok | | |

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|--|
| 1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36. |
| 2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets. |
| 3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application |

| | |
|---|---|
| Date of submission of the demand 08 JULY 2000 (08.07.2000) | Date of completion of this report 25 APRIL 2001 (25.04.2001) |
| Name and mailing address of the IPEA/KR Korean Intellectual Property Office Government Complex-Taejon, Dunsan-dong, So-ku, Taejon Metropolitan City 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer JEON, Jong Seong Telephone No. 82-42-481-5948  |

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR00/00012

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/ or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet _____

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

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INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR00/00012

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|-----|-----|
| Novelty (N) | Claims | 1-6 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 1-6 | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | 1-6 | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

Claims 1-6 meets the criteria set out in PCT Article 33(2),(3),(4), because the prior art does not teach or fairly suggest the e-mail add-on system comprising ;
a domain suffix e-mail address representation system including system of a receiver mail address in form of "USERID@DOMAIN.suffix"
, and a relay-mode add-on service mail server installed to an internet host
, and meta domain name system including a meta domain name database
, and because this invention has industrial applicability.

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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

| | |
|--|--|
| Date of mailing (day/month/year) 15 August 2000 (15.08.00) | |
| International application No. PCT/KR00/00012 | Applicant's or agent's file reference soobok04 |
| International filing date (day/month/year) 11 January 2000 (11.01.00) | Priority date (day/month/year) 13 January 1999 (13.01.99) |
| Applicant LEE, Soobok | |

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
08 July 2000 (08.07.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Olivia RANAIVOJAONA

Telephone No.: (41-22) 338.83.38

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|---|---|---|
| Applicant's or agent's file reference soobok04 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/KR00/00012 | International filing date (day/month/year) 11 JANUARY 2000 (11.01.2000) | (Earliest) Priority Date (day/month/year) 13 JANUARY 1999 (13.01.1999) |
| Applicant LEE, Soobok | | |

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawing to be published with the abstract is Figure No. 2

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

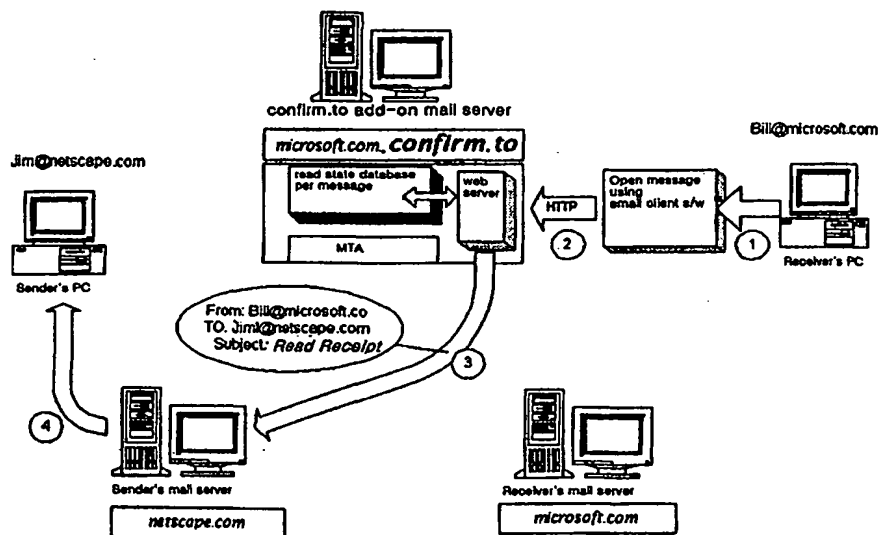
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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|--|-----------|---|
| (51) International Patent Classification ⁷ : H04L 12/58 | A1 | (11) International Publication Number: WO 00/42747 (43) International Publication Date: 20 July 2000 (20.07.00) |
| (21) International Application Number: PCT/KR00/00012 (22) International Filing Date: 11 January 2000 (11.01.00) (30) Priority Data: 1999/638 13 January 1999 (13.01.99) KR (71)(72) Applicant and Inventor: LEE, Soobok [KR/KR]; Postel Services, Co., Anam Tower 2018, Yoksam-dong 702-10, Kangnam-ku, Seoul 135-080 (KR). | | (81) Designated States: CN, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>In English translation (filed in Korean).</i> |

(54) Title: INTERNET E-MAIL ADD-ON SERVICE SYSTEM



(57) Abstract

A system and method is provided for constructing an internet e-mail add-on service system that can seamlessly operate on the conventional SMTP internet message transport network. The method and system make use of a recipient e-mail address extended by a domain suffix. The domain suffix portion specifies both the kind of email add-on services to be applied and the intermediate mail relay server to perform the service on the message before delivery to the recipient.

FOR THE PURPOSES OF INFORMATION ONLY

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INTERNET E-MAIL ADD-ON SERVICE SYSTEM

TECHNICAL FIELD

The present invention relates to a system and a method for structuring an e-mail add-on service such as a service for interpreting a message into other natural language, a mail read confirmation notification service, a lottery mail sending service and a Christmas picture post-card transmitting service, which are not considered as a basic function of the e-mail.

BACKGROUND ART

In this specification, the e-mail add-on service is defined as a service, which is not considered as a basic function of the common e-mail service among services related to the Internet e-mail. Such service may be a service for interpreting a message into other natural language, a mail read confirmation notification service, a lottery mail sending service or a Christmas picture post-card transmitting service. The Internet Engineering Task Force (IETF) already provides the international standard for the mail read confirmation notification service (RFC (Request for Comments) 2298). However, because the mail read confirmation notification service could be used only when a sender and a receiver use mail client software supporting the standard at the same time, the service is not broadly used. Also, the lottery mail sending service and the

Christmas picture post-card transmitting service are not prospective to be used as a basic function of the mail client software or the mail server software because they have no need or impossible to be standardized. The Christmas picture post-card is commonly provided in WWW (World
5 Wide Web) service.

On the Internet having characteristics of decentralized control authority, no service provider has an authority to change the mail server software or the mail client software of the sender and the receiver for providing a specific e-mail add-on service over the world.

10

DISCLOSURE OF INVENTION

The object of the invention is to build an independent e-mail add-on service system which is compatible with the universal e-mail infrastructure of the Internet and may give a service having a specific add-
15 on function designated by a sender over the whole Internet by using interconnection with the universal e-mail infrastructure.

In order that a service provider may independently provide a service over the world at once, it is necessary that the service should not request any change of the universal infrastructure of the e-mail client software and
20 the server software, in which a lot of time and money have already invested and which has decentralized authorities.

For satisfying the necessity, the present invention employs a relay-mode mail server which is interposed into an intermediate transmission

path between mail servers of a sender and a receiver in order to process a message required for the add-on service.

Generally, a message, which the sender transmits through the mail client server, is transmitted through a SMTP (Simple Mail Transfer Protocol) and then stored in a queue in a receiver-SMTP server, designated in installing the mail client. The receiver-SMTP server then determines to which Internet host the message is transmitted on basis of a "DOMAIN" portion of a receiver address "USERID@DOMAIN" designated in the message (see RFC822, RFC821 in IETF).

The "DOMAIN" portion is the only position where a relay-mode mail server executing the add-on service may be inserted into the common mail transmission path. At this time, the sender should use a new receiver mail address by replacing the "DOMAIN" portion of the receiver mail address into an Internet host name ("DOMAIN-NEW") having the relay-mode mail server. In addition, the "DOMAIN-NEW" should include the "DOMAIN" portion in a distinguishable manner and maintain minimum amount of information to relay the message having the add-on service to the receiver mail server.

Therefore, the present invention defines a Domain Suffix (hereinafter, referred to as ".suffix") according to the add-on service and its option. The present invention attaches the ".suffix" after the "DOMAIN" portion of the receiver mail address in order to form a full name of "DOMAIN.suffix". The present invention then adopts the

“DOMAIN.suffix” as the Internet host name of the relay-mode mail server.

Based on such idea, a method of systematically structuring the e-mail add-on service system will be explained in the below description.

WO98181249A1 is a reference of the present invention.

5

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of preferred embodiments of the present invention will be more fully described in the following detailed description, taken accompanying drawings. In the
10 drawings:

FIG. 1 shows e-mail flows for a sender to transmitting a mail to “USERID@DOMAIN” and “USERID@DOMAIN.suffix”;

FIG. 2 shows interaction and flows among a Meta domain name server, an add-on service mail server and a web server of a mail read
15 confirmation notification system; and

FIG. 3 shows a flow for notifying a message receipt in the mail read confirmation notification system.

BEST MODES FOR CARRYING OUT THE INVENTION

20 The e-mail add-on service system of the present invention includes three elements.

First Element

A domain suffix e-mail address representation system including a

syntax of a mail address having a form of "USERID@DOMAIN.suffix", which attaches a domain suffix corresponding to the add-on service, and a series of definition for meaning of the syntax. By attaching the domain suffix, the domain suffix e-mail address representation system specifies
5 a type of the add-on service and designates a service host in charge of the add-on service.

Second Element

A message modifying-type relay mode add-on service mail server for receiving an e-mail message having a receiver address
10 "USERID@DOMAIN.suffix", processing the e-mail message according to the type and option of the add-on service designated by the ".suffix", and transmitting the processed e-mail message to the original receiver address "USERID@DOMAIN".

Third Element

15 A Meta domain name system for corresponding the "DOMAIN.suffix" to an Internet Protocol (IP) address of a relay mode mail server host in charge of the add-on service of the "DOMAIN".

Next, the three elements are described in detail together with four
20 Internet add-on service subsystems, which may be realized as a subsystem of a common system.

1. Domain Suffix E-mail Address Representation System

First Element

The address representation system of the present invention has a characteristic in point of attaching a domain suffix after a receiver e-mail address. Such characteristic is powerful in that the domain suffix may
5 specify a type of the add-on service and designate a service host in charge of the add-on service at the same time. Users of the add-on service recognizes such representation method to be identical to a usage method of the e-mail add-on service.

The domain suffix of each add-on service always has a root domain
10 suffix and a supplementary domain suffix. The root domain suffix should be a dependent domain registered in the Internet or a child domain of the dependent domain.

For best understanding, let's take two examples using a main domain suffix ".confirm.to" for the mail read confirmation notification
15 service and a supplementary domain suffix having ".add" in the beginning.

In the case of "apple.com.add.startec.advertizement.confirm.to", "apple.com" is the "DOMAIN" portion, "add.startec.advertizement" is the supplementary domain suffix and ".confirm.to" is the root domain suffix.

In the case of "apple.com.confirm.to", it is considered that the
20 supplementary domain suffix has a null string value. As a reference, ".to" among ".confirm.to" is a country top-level domain of the kingdom of Tonga, which may be replaced with an international registration with ".com" or ".net".

The supplementary domain suffix is attached between the original mail address domain name and the root domain suffix for flourishing or limiting a function of the add-on service. A range of the character string occupied by the supplementary domain suffix may be defined depending on the add-on service. A supplementary domain suffix in a syntax having a variable parameter may have unlimited character string value.

microsoft.com.add.*.photo.post-card.to. IN A 202.30.244.18

10 2. Relay Mode Add-on Service Mail Server

The relay mode add-on service mail server receives and processes a mail message having a receiver address "USERID@DOMAIN.suffix", and has three characteristics below.

First, the server is installed on an Internet host having a "DOMAIN.suffix" type domain name.

Second, the server is interposed during transmitting a mail message from a sender mail server to a receiver mail server and relays the message after processing in order to apply the add-on service instead of the two mail servers, that is, in a relay mode.

Third, the server has a characteristic of a message modifying mail server which may modify a message according to the corresponding add-on service on basis of a root domain suffix and a supplementary domain suffix specified in the receiver address "USERID@DOMAIN.suffix".

2-1. Advantages of the Relay Mode Add-on Service Mail Server

First, the server does not need to change existing mail servers of a sender and a receiver. The relay mode add-on service mail server may
5 naturally expand functions of the two mail servers of the sender and the receiver by interposing into a transmission path between the sender mail server and the receiver mail server.

Second, the relay mode add-on service mail server may independently provide the add-on service over the world at once without
10 any assistance of the sender/receiver DOMAIN manager because the server is independent of the mail servers of the sender/receiver mail DOMAIN in view of operation and management.

Third, because the sender designates the "DOMAIN.suffix" as the first mail receiving server, the relay mode add-on service mail server may
15 provide an e-mail add-on service to the users of the DOMAIN without any interference or legal limitation from the manager.

Fourth, if structuring the Meta domain name system to correspond "DOMAIN.suffix" to an IP machine of one relay server machine for all
DOMAINs, the relay mode add-on service mail server may provide the add-
20 on service over the world at once with use of only one server. The relay mode mail server may be set up to transmit a final message to the receiving mail server after processing a requested operation based on ".suffix" regardless of a range of DOMAIN among the receiver address

“DOMAIN.suffix”. For the purpose of load distribution and security management, the server may be installed step by step by making side branches to a responsible relay server for each level.

5 2-2. Message Add-on Service Process

FIG. 1 comparatively shows e-mail flows when the sender transmits a mail to “USERID@DOMAIN” and to “USERID@DOMAIN.suffix”, in which each part is described below in detail.

First, whatever address the sender designates, the mail message is
10 added to a standby matrix of the receiver mail server to wait for transmission outside (process 1 of FIG. 1).

If the message’s turn comes around, the mail server queries a root domain name server (referred to “ns.suffix”, Meta domain name server) of “.suffix” domain in order to find out an IP address of the “DOMAIN.suffix”
15 (process 2 of FIG. 1).

The message is transmitted to the IP address corresponding to the “DOMAIN.suffix” with use of SMTP (Simple Mail Transfer Protocol) (process 3 of FIG. 1). The “DOMAIN.suffix” server receiving the message then makes a new message by modifying the message or adding new content to
20 the message according to characteristics of the add-on service (process 4 of FIG. 1).

After dividing the receiver e-mail address “USERID@DOMAIN.suffix”

into the original receiver address "USERID@DOMAIN" and the domain suffix ".suffix", the domain suffix is divided again into the root domain suffix and the supplementary domain suffix in order to determine kind and content of the add-on service intended by the sender.

5 With making a modified new message by applying the add-on service to the message, a state information data record for each message is stored in a database of the server, if required. For this reason, each message is endowed with a message ID by generating a peculiar serial number.

 The new message is then transmitted to the original receiver e-mail
10 address "USERID@DOMAIN", which is a final receiver (process 5 in FIG. 1).

 The receiver then reads the message stored in the receiver e-mail server with use of a mail client on his/her own person computer (process 6 in FIG. 1).

15

2-3. Message Database of the Message Modifying Mail Server

 The state information of each mail message related to the add-on service may be stored in the "DOMAIN.suffix" host in order to not only keep the service operation on record but also accomplish a specific
20 purpose of the add-on service through interaction with the receiver mail client.

 There is an interactive add-on service, which realizes the add-on service by a series interactions with the "DOMAIN.suffix" and Internet after

the receiver receives the mail. In this case, information of the message ID, which is a key for the state information database record, should be added to a message text or a mail header, finally transmitted to the receiver, in a suitable manner for the add-on service in any form.

5

3. Detailed Description of Meta Domain Name System

3-1. Background

The domain name is a name that describes peculiar names of all hierarchies consisting of host and network identifiers from right to left in a hierarchical name space by representing the names with “.” (dot)” from the top-level hierarchy to the bottom-level hierarchy. For examples, there are www.microsoft.com, netscape.net, www.nic.go.kr, etc. At this time, “.com”, “.net”, “.kr” are called as a top-level domain (referred to TLD), and microsoft.com, netscape.net, go.kr are called as a second-level domain.

Domain Name System (DNS) is a worldwide decentralized database system for corresponding the domain name to a respective IP address. The DNS includes a database for relation between an Internet domain name and an IP address (having A-type records) and an Internet e-mail transmission path database (having MX type records). The DNS also has all Internet TCP/IP communications for determining the flow and path for transmitting an e-mail from a sender to a receiver (see RFC1034, RFC1035 of IETF).

The domain name is designated to a primary domain name server

for each hierarchy for corresponding IP addresses of each of domain and sub-domain to the server. For example, in the case of www.cs.uiuc.edu, the top-level domain ".edu" is designated to "ns.internic.net" as the primary domain name server, while "uiuc.edu" is designated to
5 "ns.uiuc.edu (Illinois Univ.)" as the primary domain name server. Such role assignment is accomplished by adding, to the domain name database of "ns.internic.net", a content (NS type record) of delegating the primary domain name server managing authority for the "unic.edu" to the "ns.uiuc.edu".

10 A manager of the "ns.unic.edu" determines whether the "cs.uiuc.edu" and the "www.cs.uiuc.edu" have whole authority of the primary domain name server for each sub-domain.

Returning to the subject, there is need to build a primary domain name server for ".suffix" because "DOMAIN.suffix" is a sub-domain name
15 of a specific domain ".suffix". However, in the Internet where domains are dynamically created and deleted, it is impossible to make database records of "DOMAIN.suffix" for all DOMAINS in view of decentralized characteristics and size of the Internet. Particularly, it is even more impossible when the DOMAIN includes a supplementary domain suffix having a variable
20 parameter.

The Meta Domain Name System of the present invention means a domain name system having a particular database (Meta Domain Database) for managing a domain name of a "DOMAIN.suffix" type. Such

system should be built on a primary domain name server host in charge of a dependent domain name of the primary domain suffix preferentially. The server software for providing a service of the Meta domain name database will be called as the Meta Domain Name Server.

5

3-2. Characteristics of Meta Domain Name System

The Meta domain name server operates identical to a common domain name server in view of DNS protocol interaction with outside (see RFC1034, RFC1035 of IETF), but has three characteristics in view of
10 database configuration.

First, a resource record of all domain name database managed by the Meta domain name server basically has a wildcard attribute.

Second, a more specific one among the resource records has a priority in selecting IP address query result.

15 Third, in case that the add-on service uses a parameterized supplementary domain suffix, the domain name database supports analysis of the resource record with representation of a variable parameter.

The core of the Meta domain name server is in such database
20 constructing method. The domain name server software is just means for providing the database, and most of common up-to-date name server software supports such database construction directly or indirectly.

3-3. Explanation for each Characteristic

First, in case that the root domain suffix is “.confirm.to” as an example, assume that the domain name database resource record has a below form for “apple.com.confirm.to” (the real input database record may
5 be not identical to the above, and it is different according to a used domain name server software).

```
apple.com.confirm.to. IN A 202.30.244.15
```

At this time, if “apple.com.confirm.to” record has the wildcard attribute, all sub-domains after “apple.com” are always corresponded to
10 same value as an IP address of “apple.com.confirm.to”. That is, it is considered as “*.apple.com.confirm.to” as if a wildcard character *(asterisk) of UNIX shell command is omitted in the front. Therefore, “host1.marketing.apple.com.confirm.to” and “host2.korea.international.
apple.com.confirm.to” match with the same “*.apple.com.confirm.to” so to
15 correspond to the IP address of 202.30.244.15 like “apple.com.confirm.to”.

Second, assume that the resource record should be divided because of requiring a separate relay-mode mail server only for “usa.apple.com.confirm.to” and its sub-domains. For the assumption, resource records are specified as follows.

```
20 usa.apple.com.confirm.to. IN A 202.30.244.16  
apple.com.confirm.to. IN A 202.30.244.15
```

At this time, it is meaningful that “usa.apple.com” has a priority to “apple.com”. Because both records are considered to omit “*” in the front,

there remains ambiguity that "*.usa.apple.com" may be considered to be included in "*.apple.com" in view of their forms. Therefore, for any domain name query, it should be clearly distinguished whether one has a priority between the two resource records.

5 At this time, it is defined that "usa.apple.com.confirm.to" is more specific than "apple.com.confirm.to", and the Meta domain name server is constructed that an IP address query result for more specific resource record has a priority.

On the other hand, in the beginning of the add-on service, if only
10 one relay mail server host may process the add-on service for all DOMAINS, one resource record below will do.

confirm.to. IN A 202.30.244.15

Third, assume that a Christmas picture post-card sending add-on service uses a parameterized supplementary domain suffix, as an example.

15 Assume that the root domain suffix is ".post-card.to" and a BNF syntax of the supplementary domain suffix is "add.* (midi | Photo)". Promise that ".*" portion is not a real character string "*" but a variable parameter, which may be replaced with other word selected by the sender.

- 1) bill@microsoft.com.post-card.to ,
- 20 2) bill@microsoft.com.add.yosemite.park.photo.pose-card.to ,
- 3) bill@microsoft.com.add.christmas.carol.song.midi.post-card.to

For three receiver mail addresses, if the sender sets the

supplementary domain suffix as a null string value (or does not designate the supplementary domain suffix) as described in the example 1), a content voluntarily designated by the server will be selected and sent in the post-card. In the example 2), "yosemite.park.photo" will be a variable
5 parameter, while "christmas.carol.song.midi" will be a variable parameter in the example 3).

As a result, that the Meta domain name database supports the resource record having a parameterized supplementary domain suffix means that resource records in below can be designated by the Meta
10 domain name database.

microsoft.com.add.*.midi.post-card.to. IN A 202.30.244.15

microsoft.com.add.*.girl.photo.post-card.to. IN A 202.30.244.16

microsoft.com.add.*.park.photo.post-card.to. IN A 202.30.244.17

15 4. Mail Read Confirmation Notification Service System

4-1. Background

The mail read confirmation notification service is a service to confirm the sender that the receiver receives and reads e-mail, of which method and procedure are standardized by IETF (RFC2298,
20 <http://www.inc.org/rfc2298>). However, because the standard needs to change the e-mail server and the client software of the sender, it is delayed to spread the mail read confirmation notification service, which makes it difficult to provide the service over the world at once.

The mail read confirmation notification service is built as one specific concept of the Internet e-mail add-on service system of the present invention, which is characterized in that it may provide the mail read confirmation notification service only by that the sender attaches the domain suffix “.confirm.to” or “.confirm.cc” at the end of the receiver e-mail
5 regardless of the standard of the Internet.

4-2. Configuration of E-mail Read Confirmation Notification Service System

10 Process 1: Based on the add-on service Meta mail address representation system of the Element 1 of the present invention, a formal Internet second domain may be registered by selecting a pair of second domains having same name, which has the root domain suffix for the e-mail read confirmation notification service and the top-level domain of “.to”
15 and “.cc”.

For example, if securing the Internet domain names “confirm.to” and “confirm.cc”, the meaning of the add-on service for each domain suffix is defined as follows. If attaching the domain suffix “.confirm.to” at the end of a mail address, the mail read confirmation notification is transmitted
20 only to the sender when the mail is received. In case that there are at least two receivers, the domain suffix “.confirm.cc” is attached in order to transmit the mail read confirmation notification not only to the sender but also to the receivers (if exist) when the mail is received. “.confirm.” may

be replaced with other domain such as receipt, notice, etc., if possible.

“to” is a standardized mail header name indicating a sender of e-mail, which is easily recognized by users. “cc (carbon copy)” is also a standardized mail header name, which may objectively transmit the
5 meaning of sending a carbon copy of the mail read confirmation notification to be sent to the sender to other receiver. “.to.” is a country top-level domain of the Kingdom of Tonga, while “.cc” is a country top-level domain of the Island of Cocus Keeling.

Process 2: Based on the Meta domain name system of the Element
10 3 of the present invention, two Meta domain name databases having the above two domain names as the root domain suffix are constructed. For the domain names having shapes of “DOMAIN.conform.to” and “DOMAIN.confirm.cc”, a mail host machine in charge of the service is secured and an IP address thereof is registered.

15 Process 3: Based on the relay-mode add-on service mail server of the Element 2 of the present invention, a message modifying e-mail relay server system for realizing the mail read confirmation add-on service is established. The mail read confirmation service needs interaction between the receiver mail client and the relay sever. Therefore, the mail
20 read state database record for each message is created and managed at the relay server when processing the message. Also, a suitable HTML (Hypertext Markup Language) tag is inserted into the text in the modified message in order to transmit a HTTP (Hypertext Transfer Protocol) query

for automatic mail read confirmation notification to the relay server. Such server system is installed to each relay mail server host machine registered to the database in the Process 2.

Process 4: A web server is installed in the relay server in order to realize the mail read confirmation notification service through interaction between the receiver mail client and the relay server. The web server receives the HTTP query for a mail read state report from the receiver mail client, reflects the query on the mail read state database for each message, and then transmits a mail read confirmation notification.

FIG. 2 shows operation flows for illustrating interaction among the Meta domain name server, the add-on service mail server and the web server while the modified e-mail for the add-on service reaches at the final receiver after the sender sends the mail with attaching ".confirm.to" domain suffix at the end thereof.

FIG. 3 shows flows of transmitting the mail read confirmation notification to the sender through interaction with the web server in the relay server by the HTML tag added in the process 4 of FIG. 2, when the receiver reads the received mail on line.

At this time, it is assumed that the receiver mail client is connected to the Internet on line and common functions to display the HTML tag is prepared (e.g. Outlook Express of Microsoft, Netscape Messenger of Netscape, Eudora Pro of Eudora, etc.).

4-3. Detailed Description for Message Modifying Process for Add-on Service

After endowing a peculiar serial number for each e-mail message, the mail read state database record for storing the mail read state data is generated with the serial number as a key. In the HTML version of the message text, a HTML document having a URL (Uniform Resource Locator) implying the endowed peculiar serial number and a receiver e-mail address.

A suitable HTML tag is selected such that the URL causes interaction between the web server of the relay server and the HTTP protocol by the inserted HTML tag automatically or by recognition behavior of the receiver when the final receiver receives the message and makes the message displayed on a screen may be reflected on the mail read state database.

For example, a tag `` may be inserted after the text. The tag is an image tag having 1 dot of vertical and horizontal size, which is not easily seen. The tag sends a URL query having the mail read state information to the web server in the relay server, which designated for the HTTP query, in order to update the mail read state information.

In order to add the HTML tag in the text, the mail message text should have an HTML format. Therefore, if the text is a general text

(MIME (Multi-purpose Internet Mail Extension) has a text/plain format), the HTML tag is inserted after automatically converting the message text into an HTML format.

The web server reflects the mail read information on the corresponding database, generates a mail read confirmation notification message and then transmits the mail read confirmation notification message to an original sender address written in the record. If ".confirm.cc" is attached to the receiver address as a domain suffix, the web server transmits the notification message not only to the sender but also to other receivers specified in the e-mail message.

5. Lottery Mail Sending Add-on Service System

The lottery mail sending add-on service built as one specific concept of the Internet e-mail add-on service system of the present invention is constructed as follows.

Process 1: Depending on the add-on service mail address representation system of the Element 1 of the present invention, an Internet second domain formally registered in the Internet is selected and registered as a root domain suffix for the lottery mail sending add-on service.

If securing an Internet domain name "loto.to" for that purpose, the meaning of the add-on service is defined as follows. When attaching the domain suffix ".loto.to" at the end of the mail address to be sent, an online

lottery ticket issued for the receiver is added to the message to be transmitted. If possible, other domain suffix will be available instead of ".loto.to". A supplementary domain suffix may also be designated. If the supplementary domain suffix has a syntax "add.*", "*" (asterisk) may
5 include a symbol about kind of the lottery known to the sender. For example, a domain "apple.com.add.motorola.loto.to" will be available.

Process 2: Depending on the Meta domain name system of the Element 3 of the present invention, a Meta domain name database having a root domain suffix ".loto.to" and supporting the supplementary domain
10 suffix syntax is constructed. Then, a mail host machine in charge of the service for "DOMAIN.loto.to" is secured and then an IP address thereof is registered.

Process 3: Depending on the relay-mode add-on service mail server of the Element 2 of the present invention, a message modifying mail relay
15 server system for realizing the lottery mail sending add-on service is constructed. Because the service requires management of the mail read state database for a receiver who wins in the lottery, a lottery win state database record for each message is generated and managed in the relay server. Also, the HTML tags are inserted into the modified message such
20 that the receiver may recognize information about the issued online lottery ticket when reading the mail. The server system is installed to each relay mail server host machine registered in the database in the process 2.

6. Picture Post-card Sending Add-on Service System

The picture post-card sending add-on service built as one specific concept of the Internet e-mail add-on service system of the present invention is constructed as follows.

5 Process 1: Based on the add-on service mail address representation system of the Element 1 of the present invention, an Internet second domain formally registered in the Internet is selected and registered.

 If securing an Internet domain name "post-card.to" for that purpose, the meaning of the add-on service is defined as follows. When attaching
10 the domain suffix ".post-card.to" at the end of the mail address to be sent, a HTML type message, in which a picture post-card flourishes a background, is transmitted. If possible, other domain suffix will be available instead of ".post-card.to". A supplementary domain suffix may also be designated. The supplementary domain suffix has a syntax
15 "add.*", in which "*" (asterisk)" may include a symbol about kind of the picture post-card known to the sender. For example, an address attaching a supplementary domain suffix "apple.com.add.yosemite-park.post-card.to" will be available.

 Process 2 : Based on the Meta domain name system of the Element
20 3 of the present invention, a Meta domain name database having a root domain suffix ".post-card.to" and supporting the supplementary domain suffix syntax is constructed. Then, a mail host machine in charge of the service for "DOMAIN.post-card.to" is secured and then an IP address

thereof is registered.

Process 3 : Based on the relay-mode add-on service mail server of the Element 2 of the present invention, a message modifying mail relay server system for realizing the picture post-card sending add-on service is constructed. The relay server should have a database containing symbol and content of the post-card. Also, the HTML tags are inserted in order to analyze kind of the post-card specified in the supplementary domain suffix and apply the post-card as a text background of the modified message. The server system is installed to each relay mail server host machine registered in the database in the process 2.

7. Mail Interpretation Sending Add-on Service System

The mail interpretation sending add-on service built as one specific concept of the Internet e-mail add-on service system of the present invention is constructed as follows.

Process 1: Depending on the add-on service mail address representation system of the Element 1 of the present invention, an Internet second domain formally registered in the Internet is selected and registered.

If securing an Internet domain name "interpret.to" for that purpose, the meaning of the add-on service is as follows. When attaching the domain suffix ".interpret.to" and a supplementary domain suffix ".from.LANG1.to.LANG2" at the end of the mail address to be sent, the

service sends a new message interpreted into a designated language to a receiver. If possible, other domain suffix will be available instead of ".interpret.to". The supplementary domain suffix has a syntax "from.*.to.*", and "*" (asterisk)" may include a symbol about a language for the interpretation known to the sender. For example, an address attaching a supplementary domain suffix "apple.com.from.english.to.french.interpret.to" will be available.

Process 2: Depending on the Meta domain name system of the Element 3 of the present invention, a Meta domain name database using "interpret.to" as a domain suffix and supporting the supplementary domain suffix syntax is constructed. Then, a mail host machine in charge of the service for "DOMAIN.interpret.to" is secured and then an IP address thereof is registered.

Process 3 : Depending on the relay-mode add-on service mail server of the Element 2 of the present invention, a message modifying mail relay server system for realizing the mail interpretation sending add-on service is constructed. The server system is installed to each relay mail server host machine registered in the database in the process 2.

With use of the Internet e-mail add-on service system of the present invention, a sender just attaches a domain suffix for the corresponding add-on service at the end of a receiver e-mail address in order to use the add-on service. The add-on service designated by the domain suffix is

automatically executed with use of at least one service host of the add-on service provider.

Therefore, without changing a sender e-mail server and a client software, the service provider in itself may provide the add-on service over
5 the world at once, which promotes emergence of new add-on services and spreads the new add-on service over the world rapidly. This will drive advent, competition and innovation of the e-mail service.

What is claimed is:

1. An e-mail add-on system comprising:

a domain suffix e-mail address representation system including a
5 syntax of a receiver mail address in form of "USERID@DOMAIN.suffix"
having a domain suffix (.suffix) selected for an e-mail add-on service and
a series of definitions for meaning of the syntax, the domain suffix having
a root domain suffix selected in formally registered domain names in the
Internet and a supplementary domain suffix for limiting the add-on service
10 represented by the root domain suffix;

a relay-mode add-on service mail server installed to an Internet host
having a "DOMAIN.suffix" type domain name for receiving a message
having a "USERID@DOMAIN.suffix" type receiver e-mail address, the relay-
mode add-on service mail server making a new message by processing the
15 add-on service defined in the domain suffix e-mail address representation
system and applying options of the add-on service according to contents
of the root domain suffix and the supplementary domain suffix specified
in ".suffix", the relay-mode add-on service mail server then relaying the
new message to an original receiver address "USERID@DOMAIN"; and

20 a Meta domain name system including a Meta domain name
database for showing relation between a "DOMAIN.suffix" type domain
name and an IP (Internet Protocol) address of a relay-mode mail server
host in charge of the add-on service designated by ".suffix" for the

“DOMAIN” portion, and a domain name server software for providing the add-on service.

2. The e-mail add-on service system as claimed in claim 1,
5 wherein, in the domain suffix e-mail address representation, the supplementary domain suffix has a syntax containing a variable parameter for flourishing the options of the add-on service; and

wherein, the Meta domain name system, the Meta domain database and the Meta domain name server include the syntax containing a variable
10 parameter.

3. The e-mail add-on service system as claimed in claim 1,
wherein the domain suffix e-mail address representation system uses a pair of second domains having same name and “.to” and “.cc” as a
15 top-level domain, in which the domain suffix e-mail add-on service system defines that a root domain suffix including “.to” represents a service for transmitting a mail read confirmation notification only to a sender and a root domain suffix including “.cc” represents a service for transmitting the mail read confirmation notification to other receiver except the sender and
20 the receiver;

wherein the Meta domain name system corresponds to a pair of the domain suffix respectively;

wherein the e-mail add-on service system further comprises a

message modifying relay-mode mail server for adding a HTML (Hypertext Markup Language) tag to a message text and maintaining a mail read state database for each mail message; and

wherein the e-mail add-on service system further comprises a web
5 server for receiving a HTTP (Hypertext Transfer Protocol) query for a mail read state report from the receiver mail client and transmits a mail read confirmation notification.

4. The e-mail add-on service system as claimed in claim 1,
10 further comprising a message modifying relay-mode mail server for adding a HTML tag containing information for a lottery ticket issued or to be issued to the receiver and maintaining a lottery win state database for each mail message.

15 5. The e-mail add-on service system as claimed in claim 1, further comprising a message modifying relay-mode mail server for selecting a picture post-card designated by the domain suffix which the sender attaches at the end of the receiver address and modifying the mail message by applying the picture post-card to the mail message.

20

6. The e-mail add-on service system as claimed in claim 1, further comprising a message modifying relay-mode mail server for modifying the mail message by interpreting and rewriting the mail

message into a designated language according to an language interpretation instruction designated by the domain suffix which the sender attaches at the end of the receiver address.

Figure

Figure. 1

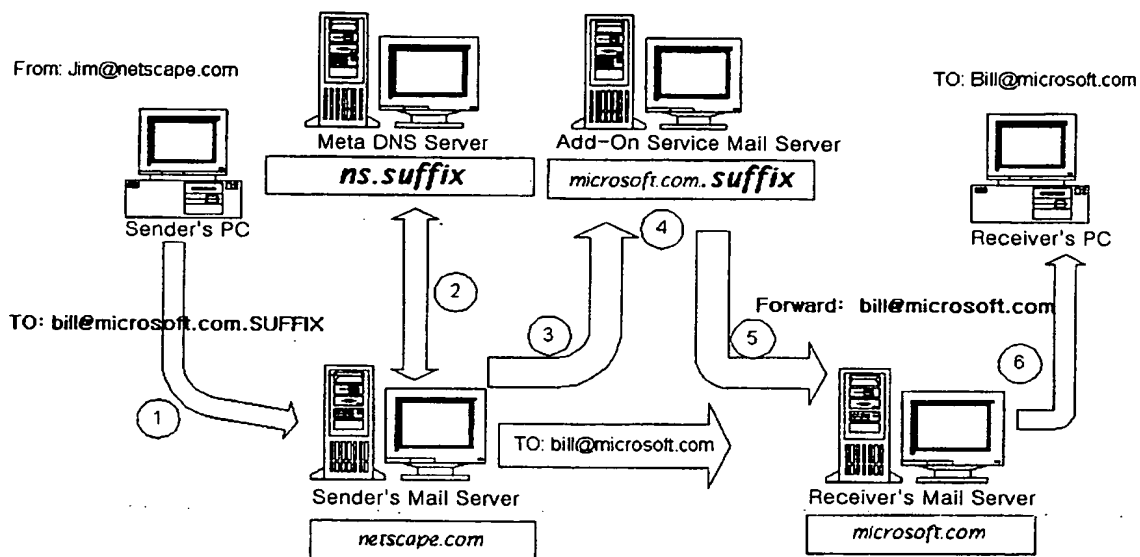
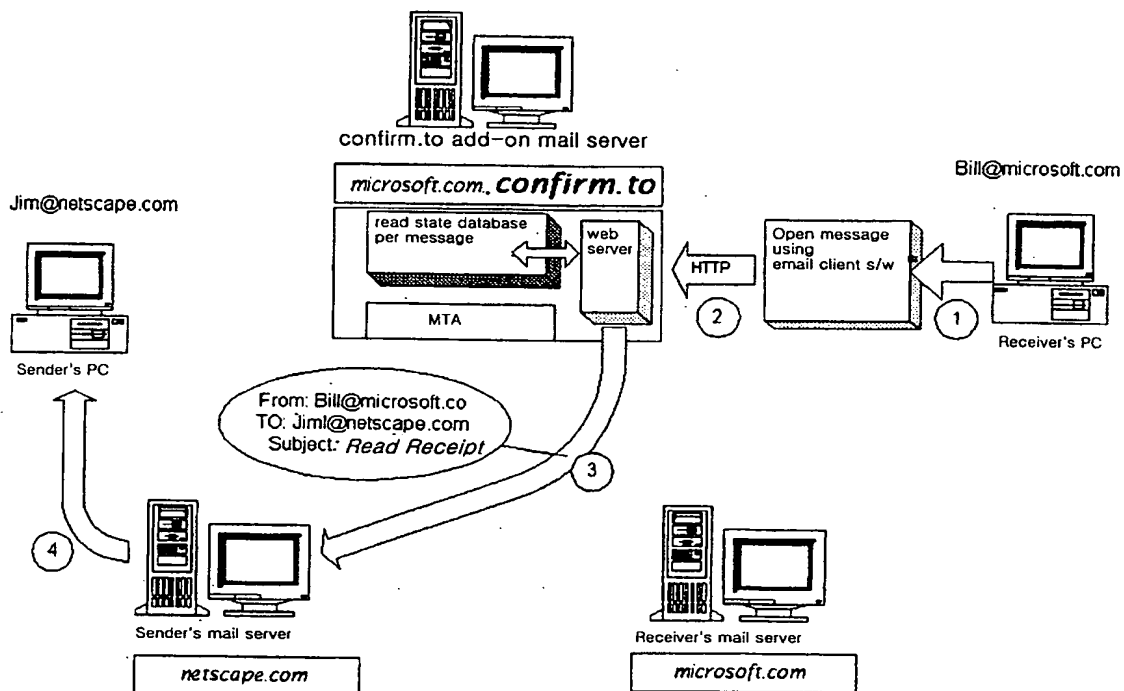
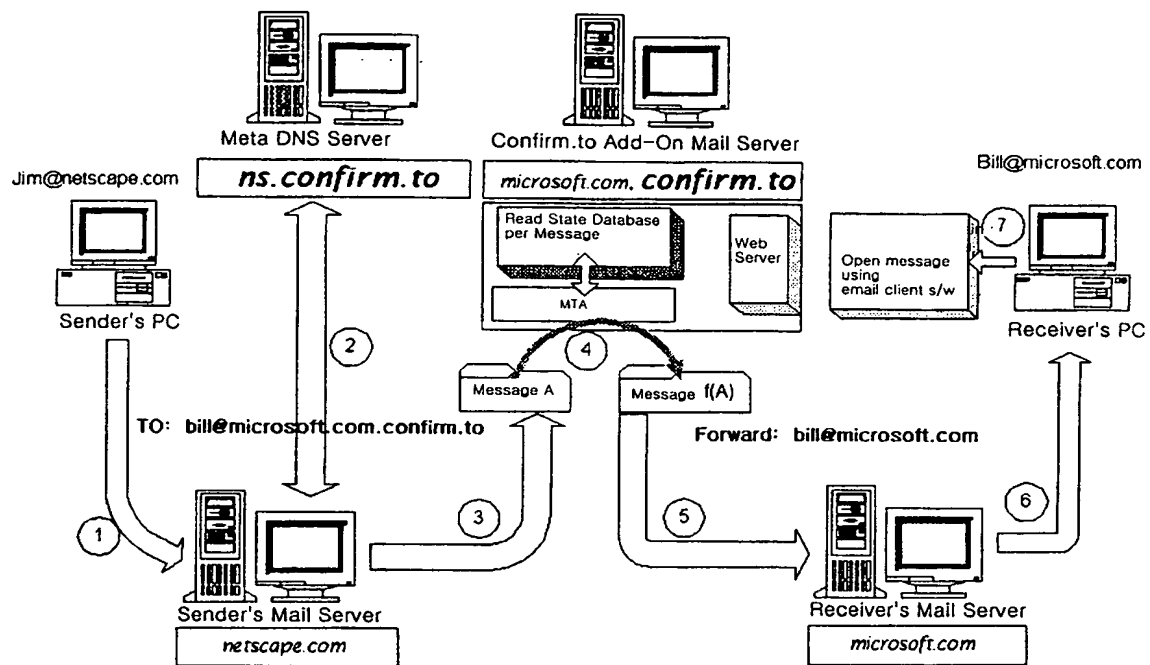


Figure. 2



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Figure. 3



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR00/00012**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 H04L 12/58**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04L 12/58, G06F 9/318, G06F 12/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
IBM patent search, USPTO, Korea PATROM, MIMOSA**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| A | US 5856974 A, Nobell, FEB. 13, 1996, abstract | 1-3 |
| A | US 5023777 A, Hideo Sawamoto, Jun. 11, 1991, Claim 1-4, abstract | 1-3 |

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

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- "P" document published prior to the international filing date but later than the priority date claimed

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Date of the actual completion of the international search

26 APRIL 2000 (26.04.2000)

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Name and mailing address of the ISA/KR

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